THESIS FOR THE DEGREE OF LICENTIATE OF ENGINEERING

Collaborating for Energy Efficient Shipping - An Ethnographic Study

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To everyone in the shipping sector that I had the pleasure to meet during this project.

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Abstract

The aim of this thesis is to better understand the emergent organising of an inter-organisational collaboration for energy efficiency in shipping, from a practice-oriented perspective. Inter-organisational collaboration is often pointed to as a means towards sustainable development, and research on energy efficiency collaboration has emerged over the last decade. However, the number of studies on the topic remains low, and there is a lack of knowledge about how such arrangements are accomplished in practice. Previous research has indicated that collaboration can be a successful means in order to increase energy efficiency performances and efforts. However, studies on other types of inter-organisational collaboration have shown that despite all the good intentions, establishing and sustaining such endeavours can be difficult in practice. The exploration of energy efficiency collaboration from a practice-oriented perspective can thus allow for a better understanding about what makes such arrangements thrive or struggle. The thesis presents an ethnographic study of *Sweship Energy*; an inter-organisational collaboration aiming for increased energy efficiency in the Swedish shipping sector. The execution of an in-depth, longitudinal study enabled for a close-up exploration of aspects like practices and experienced challenges within the initiative, and how these shifted over time. The research explores three aspects in particular: 1) how challenges experienced by the practitioners can be understood; 2) the development of collaborative practices; and 3) how the emergent organising of the collaboration can be characterised. The thesis contributes with a more nuanced understanding of the complexities in establishing and maintaining energy efficiency collaboration, and for the tasks of achieving positive outcomes from such endeavours. The study also contributes with relevant insights to practitioners participating in such initiatives. By extending the knowledge about experienced challenges and practices, the study can improve the awareness and reflections about practitioners' actions in the collaborative setting. Thus, hopefully, the thesis also contributes to a greater chance for energy efficiency collaborations to succeed and survive by decreasing the risk of collaborative inertia.

Keywords: Inter-organisational collaboration; Energy efficiency collaboration; Ethnographic study; Practice-oriented perspective; Organising; Collaborative practices; Collaborative challenges; Energy efficiency; Shipping

List of appended papers

Paper I:

Borg, J.; Yström, A.: Collaboration for Sustainable Development: Interrelating Practice and Challenges.

Submitted for review to journal *Environment, Development and Sustainability*.

A previous version of the paper was presented at the conference *The 2018 International Society for Professional Innovation Management Forum* in Boston, USA, in March 2018.

Paper II:

Borg, J.; von Knorring, H.: Inter-Organizational Knowledge-Sharing for Energy Efficiency in Practice: The Case of a Database Project.

Submitted for review to journal *Energy Research & Social Science*.

An early version of the paper was presented at the *23rd International Sustainable Development Research Society Conference* in Bogotá, Colombia, in June 2017: Borg, J.; Baumann, H.; Gabrielii, C.; von Knorring, H.: Governing through a Database? - A ”failed” database project’s role in the establishment phase of a collaborative initiative.

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Gothenburg, September 2018
Josefin Borg

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Prologue

"Today, I had a lunch meeting with John[1] and Michael[2], discussing collaboration strategy for Sweship Energy. They both have the view that a network is something with active members, in contrast to Thomas'[3] vision with an energy secretariat working more top-down to 'educate' and inspire the shipowners in energy efficiency matters through outreach activities. John and Michael wish for a network with energy managers instead, where these can learn from (and support) each other.

I know that the committee is for a more limited network and limited collaborative activities, similar to Thomas' idea. At the last committee meeting (since John could not attend himself), I tried my best to argue in his place for his more extensive vision. But I did not succeed, and consequently, in the funding application submitted the same day, these ideas were deleted. […]

So, there are two fundamentally different types of networks being discussed.

1. *The existing Sweship Energy with a broad, 'everybody-should-join' kind of approach; top-down educating shipowners about energy efficiency matters.*

2. *Fewer but more active participants, represented by 'energy managers' or similar."*

(Extract from a field note, 2015-11-12)[4]

[1] Senior chairman in Sweship Energy
[2] Future research advisor in Sweship Energy
[3] Consultant working for Sweship Energy
[4] The names are fictive

1 Introduction

As shown in the field note presented in the prologue, diverging visions and ambition levels might pull a collaboration in different directions. This can have concrete implications on what the collaborating actors can do together.

Inter-organisational collaboration is often pointed to as a means towards a more sustainable and energy efficient society – both from policy makers and researchers. As collaboration can enable organisations to tap into resources and expertise of others and thus open up for new possibilities, it is possible to be inspired by the world of collaboration (Huxham & Vangen, 2005).

However, in practice, such initiatives are not always easy to manage or sustain (e.g. Ebers & Grandori, 1997). The field note extract above demonstrates some potential challenges; continuous renegotiations, actors not agreeing on the same vision, struggles for funding, and new actors entering the scene.

Research on collaborations aiming for increased energy efficiency is emerging (e.g. Jochem & Gruber, 2007; Paramonova & Thollander, 2016) but the number of studies on the topic remains low, and there is a lack of studies focusing on the day-to-day practices of such arrangements. Thus, there is a need for more research exploring these collaborations in-depth, as that could give us insights on how the implementation of energy efficiency measures can be promoted through e.g. collaboration. This thesis presents an ethnographic study of *Sweship Energy*; an inter-organisational collaboration aiming for increased energy efficiency in the Swedish shipping sector.

1.1 Collaborating for energy efficiency – an ethnographic study

Collaboration across organisational boundaries is a well-used strategy in all kinds of settings and for a range of purposes. Policy-makers often highlight collaboration between organisations as a means to meet complex societal challenges. Some recent examples relevant for the Swedish shipping setting include the latest Swedish research policy bill (2016/17:50), the Swedish government's maritime strategy (N2015.28), and a report from the Swedish Energy Agency (2017) regarding the shipping sector's transition to becoming fossil free; all promoting boundary-spanning collaboration among companies, academic institutions and societal actors as well as highlighting the importance of support for collaborations and networks.

There are also researchers highlighting collaboration for the specific issue of increased energy efficiency. Palm and Thollander (2010) stress platforms as means for exchange across sectors and traditional professions. They argue that such arrangements have the potential to make established norms visible, and to challenge existing routines and knowledge (ibid). Continuing, previous studies on energy efficiency collaborations indicate positive outcomes regarding e.g. increased investments and implementation levels of energy efficiency measures among participants (Jochem & Gruber, 2007).

Literature on inter-organisational collaboration is emerging within the energy efficiency field. However, most studies focus on a specific type of networks in Swiss and German settings. Also, much emphasis has been on studying energy efficiency collaboration on meta-level (e.g. Jochem & Gruber, 2007; Koewener et al., 2011; Wohlfarth et al., 2017), rather than on performing in-depth studies exploring the day-to-day practices. Consequently, the knowledge about how such arrangements are accomplished in practice is limited.

In this study, I follow Weick (1993) by viewing Sweship Energy's organisational design as continuous activity. I adopt a practice-oriented perspective treating the organising of the collaboration as a nexus of practices, and as an on-going social accomplishment evolving over time through interaction and learning (Nicolini, 2012; Orlikowski, 2002). With this position, I recognise the central role of people in the day-to-day organising of Sweship Energy, and that the collaboration's practices are constituted by the collected actions of the people involved (Schmitz & Nadvi, 1999). Also, I acknowledge that the concept of practice implies doing, but doing in a historical and social context which gives structure and meaning to it (Wenger, 1998). Thus, practices are more than people's actions; they are activities which are also meaning-making, order-producing and identity-forming (Chia & Holt, 2008; Nicolini, 2009). This perspective offers a route into understanding organising as it happens (Miettinen et al., 2009), which is of importance since detailed perspectives are central in order to enhance the possibilities for inter-organisational collaborations to succeed (Hibbert & Huxham, 2010; Huxham & Vangen, 2005). Thus, by exploring what Sweship Energy's managers, participants and others do in practice, we can better understand what makes collaborations aiming for energy efficiency thrive, and what makes them regress into a state of collaborative inertia (ibid).

The participants of Sweship Energy are all organisations operating in the Swedish shipping sector. Understanding collaboration in this particular context is important since over 80 % of today's global trade by volume is transported onboard ships (UNCTAD, 2017). Also, the sector is facing a daunting challenge in reducing its emissions of greenhouse gases. The potential for an increase in energy efficiency levels within the global shipping industry is considered high (Bouman et al., 2017). However, as in several other sectors, for a range of reasons cost-effective energy reducing measures often fail to be implemented (Johnson & Andersson, 2014). To read more about the background of energy efficiency in shipping, see Appendix I.

The aim of this licentiate thesis is ***to better understand the emergent organising of an inter-organisational collaboration for energy efficiency in shipping, from a practice-oriented perspective***. In doing so, the ethnographic study has focused on specific practices and experienced challenges. The thesis is guided by three research questions:

RQ1: How can experienced challenges in the collaboration be understood?

RQ2: How are practices in the collaboration developing over time?

RQ3: How can the emergent organising of the collaboration be characterised?

The main theoretical contribution of this thesis is to the energy efficiency literature. Even if research about inter-organisational collaboration is emerging within the field, there are still limitations. The execution of an in-depth, longitudinal study using an ethnographic approach allowed for the close-up exploration of aspects like practices and experienced challenges within the collaboration, and how these shifted over time. The approach complements previous research on energy efficiency collaboration by enabling a better understanding of *what* is done in such arrangements, *how* and *why*. It allows for increased knowledge about what influences collaborations to survive or struggle. Moreover, by drawing on knowledge about the organising and manging of inter-organisational collaborations from other fields, the thesis adds to the understanding about collaboration in energy efficiency literature. Thus, the thesis strives to contribute with knowledge about energy efficiency collaborations in several ways:

- *Theoretical contributions*:
  This thesis contributes theoretically by adopting a perspective that complements previous research on energy efficiency collaboration. By applying a practice-oriented perspective, the study offers more in-depth knowledge about what could make such arrangements succeed or fail and thus, the organising of such collaborations can be better understood. Also, by exploring an empirical setting different from most previous studies on the topic, with regards to collaborative approach and organisational structure as well as national context, the thesis broadens the understanding about energy efficiency collaborations and investigates potential regional differences. In addition, the thesis also contributes to the energy efficiency literature by drawing on knowledge in other fields regarding the organising and managing of inter-organisational collaborations.

- *Practical implications:*
  By extending the knowledge about practices and experienced challenges in energy efficiency collaborations, the study also has practical implications. The research contributes to practitioners who are managing or participating in such initiatives by allowing for increased awareness and reflections about their actions in collaborative settings. In addition, as collaborations for energy efficiency often are publicly supported, the study contributes with insights important for policy-makers when considering inter-organisational collaboration as a possible policy measure.

- *Methodological contributions*:
  There is a lack of in-depth studies of inter-organisational collaborations in the energy efficiency field. Thus, this thesis makes a contribution by presenting an ethnographic study. Such an approach enables exploration of the nitty-gritty details of a collaboration's day-to-day practices as well as experienced challenges. Also, by executing a longitudinal study, the research addresses gaps in existing literature about the development over time for energy efficiency collaborations.

The thesis is constructed as a compilation thesis with two appended papers:

Paper I: "Collaboration for Sustainable Development: Interrelating Practice and Challenges"

Paper II: "Inter-Organizational Knowledge-Sharing for Energy Efficiency in Practice: The Case of a Database Project"

1.2 Thesis outline

After this introduction, the thesis unfolds in five more chapters. Chapter 2 provides the reader with a background about previous research. Chapter 3 presents the study's methodological approach. In chapter 4, the two appended papers are summarised. Chapter 5 discusses the findings in relation to the three research questions. In the final chapter 6, the thesis' conclusions are presented, including an outlook towards potential further research.

2 Previous research

The introduction gave a background to the need of more research on collaborations between organisations aiming for increased energy efficiency in shipping, and for adopting a practice-oriented perspective in such studies. This chapter will give an overview of previous research on collaboration for energy efficiency and identify limitations to this literature. Moreover, in order to address some of these identified research gaps, relevant research on the managing and organising of inter-organisational collaboration in other fields will be presented, complementing the knowledge in the energy efficiency field.

2.1 Collaborating for energy efficiency

Research on inter-organisational collaboration aiming for increased energy efficiency has emerged over the last decade but the number of studies on the topic remains low. Most previous studies in the energy efficiency field exploring collaborations have focused on a certain type of *networks* following a standardised design and approach. These initiatives, which are common in Switzerland and Germany, often consist of a defined group of local companies from mixed sectors, co-ordinated by an external actor. The networks' development typically follow a set of predetermined steps[5]: 1) initial consultation for each participating company executed by external expert, so-called energy audit; 2) developing targets for the network regarding energy efficiency improvements and greenhouse gas emission reductions; 3) regular meetings with presentations by experts as well as knowledge sharing between participants; and 4) annual monitoring of progress with regards to the initial consultation of each company (Koewener et al., 2011). The aim of these energy efficiency networks is to increase energy efficiency by enabling knowledge sharing and -creation in order to: lower transaction costs; compensate for a lack of knowledge and market awareness; and raise motivation and priority of energy efficiency aspects within the participating organisations. Commonly, companies have to pay a fee or a share of the costs for participation (Koewener et al., 2011; Paramonova & Thollander, 2016). In 1987, the first network was implemented in Switzerland, supported by the Swiss Energy Agency and promoted within the context of a new CO_2 law. During the 1990s, the concept developed and grew in numbers within Switzerland, and in 2002, the concept was transferred to Germany (Jochem & Gruber, 2007; Koewener et al., 2011). Energy efficiency networks have been widely implemented in these two countries; in 2016, around 70 Swiss networks with 2000 participants were on-going, while in Germany, there were more than 50 initiatives at the same time. Even if similar networks exist elsewhere as well, the concept has received less attention from policy makers in other countries (Paramonova & Thollander, 2016). Consequently, much of previous research in the field has focused on these two countries as empirical settings. However, the interest and the public support for similar arrangements are increasing also elsewhere, in countries such as in France, Denmark, Austria and Sweden (Backman, 2018).

The conditions for energy efficiency collaborations in Sweden differ from the Swiss and German networks previously described. However, to my knowledge, there are only a few empirical studies from Swedish settings. Paramonova and Thollander (2016) identified 32 Swedish projects that could be considered energy efficiency networks. Four of these targeted energy-intensive large industries, while the other 28 focused on small and medium sized

[5] These particular steps are for German networks. For the exact steps for Swiss networks, there might be some variations, but the approach is the same.

enterprises (SMEs). Paramonova and Thollander found that regular meetings are generally the foundation of Swedish energy efficiency networks. Other activities could include common courses, study visits, lectures or seminars as well as energy audits on company level. In Sweden, there are no common standards for such networks, and different forms of collaborations fall under this category. Funding, organisational structure, activities and ambition levels are aspects varying between networks (ibid). Moreover, Paramonova and Thollander highlight that it is common among Swedish SME collaboration projects to start with a different aim and later emerge into networks. However, the knowledge about *how* this development take place, and *what* their initial goals and practices were, is still limited. By exploring the concept from the perspectives of learning processes and communities of practice, Backman (2018) broadened the understanding of energy efficiency networks in general, and in Swedish contexts in particular. Backman, presenting a case study from a Swedish municipality, highlights informal meetings within the networks as key, and stresses the importance of factors such as trust and values for a positive outcome of such collaboration.

Previous studies have indicated that collaboration can be a successful means in order to increase energy efficiency performance and efforts. Evaluations from German and Swiss networks have shown substantial progress regarding implementing organisational measures and investments. According to participants, the networks have resulted in a significant reduction of transaction costs and faster implementation of measures (Jochem & Gruber, 2007; Wohlfarth et al., 2017). Possible reasons for these positive outcomes include increased access to resources and information, eliminated risks, and changed attitudes and behaviours among the participants (Paramonova et al., 2015). Also within the Swedish initiatives, there are indications on positive outcomes of energy efficiency collaboration beyond the effects of stand-alone energy audits (Backman, 2018; Paramonova et al., 2014; Paramonova & Thollander, 2016). However, due to aspects such as large variations between networks as well as limited follow-ups and reporting, quantified evaluations on Swedish energy efficiency collaborations have been found difficult to achieve (Paramonova & Thollander, 2016).

Several aspects and conditions have in previous studies been highlighted as key for positive network outcomes. First; commitment and motivation among involved actors has been stressed as important (Paramonova et al., 2015). This can be achieved through external incentives, such as the Swiss Co_2 law, (Jochem & Gruber, 2007; Koewener et al., 2011), or through the role of facilitators and administrators working to create engagement among participants in energy efficiency networks (Jochem & Gruber, 2007; Paramonova et al., 2015; Paramonova & Thollander, 2016). Energy audits have been described as another key for the motivation to participate, potentially due to their effect of making profitable measures visible (Dütschke et al., 2018; Jochem & Gruber, 2007). Second; developing shared targets have been highlighted as important for a positive outcome of collaborations in energy efficiency literature (Jochem & Gruber, 2007). According to Paramonova and Thollander (2016), several Swedish networks did not have defined goals agreed upon by the participants, and there was not always a mutual understanding of what was expected from the network or its participants. In some cases, it seemed as if goals had been defined to facilitate for municipalities' work on climate and energy targets rather than to support the network's development. Paramonova and Thollander thus stress proper goal setting as key for improving Swedish energy efficiency networks. They argue that networks which have general and vague goals such as *developing skills* or *spreading information*, have less chance for success. However, the importance of stating common goals

is questioned by Dütschke et al. (2018); instead, they found indications for that defining shared goals could have counteracted impacts for the motivation to participate. Third; other identified conditions important for success include top management support (Jochem & Gruber, 2007; Paramonova et al., 2015), and availability of resources (Paramonova & Thollander, 2016).

Experienced challenges among managers or participants of energy efficiency collaboration have received less attention in previous studies. However, some identified challenges include differences in engagement levels as well as lack of time and staff resources. Moreover, difficulties in measuring energy usage can affect companies' participation (Paramonova & Thollander, 2016).

Previous research has shown that sector-specific energy efficiency collaborations have both advantages and disadvantages compared to initiatives including participants from mixed industries. Actors from the same sector have more in common to share, but being competitors can limit the information sharing (Jochem & Gruber, 2007; Paramonova & Thollander, 2016). In order to create knowledge sharing, it is important to ensure that all participants feel comfortable enough to share, and that they experience a possibility to gain from the discussions (Paramonova et al., 2015). However, previous studies have shown that it can be challenging to create an environment which enables and encourage knowledge sharing (Paramonova & Thollander, 2016). Consequently, Backman (2018) highlights the importance of having enough time when building relationships and trust within networks.

To conclude, it is evident that research on collaborations aiming for increased energy efficiency has increased over the last decade, but it still has limitations. There is a lack of knowledge about how such arrangements are accomplished in practice. Thus, there is a need for more studies exploring this phenomenon from several perspectives. First, previous research in the field has primarily focused on studying collaborations on meta-level (e.g. Jochem & Gruber, 2007; Koewener et al., 2011; Wohlfarth et al., 2017). Few studies have explored single collaborations in-depth. Consequently, a thorough understanding about such arrangements' day-to-day practices is lacking, and little attention has been given to these collaborations' development over time. Continuing, even if there have been some publications from additional countries the last years, most empirical studies have still been conducted in a German or Swiss context. As previous studies have indicated differences depending on national setting (Paramonova & Thollander, 2016), more research is needed to better understand the concept in other countries. Also, few studies have focused on sector-specific collaborations consisting of a heterogenous group of participants regarding e.g. company sizes or energy efficiency efforts. Thus, as this thesis presents an ethnographic, longitudinal study of a single energy efficiency collaboration in Sweden, it complements previous research on several aspects. Moreover, by adopting a practice-oriented perspective, it allows for a better understanding about what is done within such initiatives and what make energy efficiency collaborations thrive or struggle.

Next, in order to increase the understanding about inter-organisational collaboration in the energy efficiency field, relevant previous research about the organising and managing of inter-organisational collaboration is presented below.

2.2 Inter-organisational collaboration

Collaboration between organisations can exist in many forms; as networks, joint ventures, partnerships, joint working, consortia, inter-firm associations, and alliances to mention some (Ebers & Grandori, 1997; Huxham & Vangen, 2005). They can be weak and distant, or strong and close (Kanter, 1994). Collaboration exist among and between public agencies, non-profit organisations and private companies as well as academia and others (Garousi et al., 2016; Huxham & Vangen, 2005). In this thesis, I follow Huxham & Vangen (2005) by defining inter-organisational collaboration as:

"any situation in which people are ***working across organizational boundaries*** *towards some positive ends"* (Huxham & Vangen, 2005:4)[6]

The phenomenon of inter-organisational collaboration has been extensively researched by scholars of multiple backgrounds, such as sociology, economics, politics, management, business policy, economic geography, and public policy. The field derives from a range of theoretical bases, including institutional theory, critical management studies, social network analysis, evolutionary theory, resources-dependent theory, and transaction cost economics (Huxham & Vangen, 2005).

The reasons for initiating collaboration can vary. As inter-organisational collaboration is heavily promoted and supported by governments all around the world, it can be a response to governmental push or pull. In addition, since many individual organisations also highlight the benefits of collaboration, it can also be a result of participants' organisational strategies. In other cases, the partners find themselves drawn into collaboration less intentionally. The goals for participation can also vary; to get access to resources, share risks, learn from others or together, achieve increased efficiency, co-ordinate activities or services, or even due to moral imperatives when society faces large challenges that no actor can solve on its on (Huxham & Vangen, 2005) – like the issue of sustainable development. If the collaborating actors also are competitors operating in the same sector, the market's level of maturity contributes to the probability for collaboration to be implemented. It seems as competitors from industries at either very early or mature stages are more likely to initiate collaboration (Dorn et al., 2016).

Even though collaborations encompassing a variety of actors, competencies and experiences might be necessary in order to achieve system change towards a more sustainable society, research on such endeavours have drawn attention to a number of inherent challenges that are often underestimated. Despite all the good intentions, establishing and sustaining inter-organisational collaboration can be difficult in practice (e.g. Ebers & Grandori, 1997; Eriksson, 2010; Waddock, 1988). Thus, especially considering that participation requires investments in time and resources, some scholars stress the importance for actors to be selective in which collaborative initiatives they join, and to only implement collaboration in the right situations and for the right reasons (Das & Teng, 1997; Eriksson, 2010; Huxham & Vangen, 2005; Ng et al., 2002). Below, three themes of challenges identified in the literature are highlighted:

First; a challenge that is a frequently occurring topic in the collaboration literature is the issue of developing shared goals. It is often argued that creating clear goals which all involved actors agrees upon is essential in order to achieve progress, learning and knowledge sharing (e.g. Anslinger & Jenk, 2004; Buckley et al., 2002). It is often stressed that a collaboration's goals

[6] The emphasis is original

also have effects on its practices and what can be done within it. However, Huxham & Vangen (2004) highlighted the differences between what they call *the common wisdom* – that shared and clear goals are necessary for actors to work jointly – and collaborative work in practice, where such common goals are difficult to achieve. To get disparate actors to agree to work toward a common goal, or, on how to do it, are not easy tasks. Consequently, it can be challenging to create a shared vision that all partners agree upon (Hudson et al., 1999; Huxham & Vangen, 2005). There is a fundamental paradox within collaborations which contributes to these difficulties: while the possibility of drawing on other organisations' competencies and resources is a central argument for participation, these differences might also make the involved partners aim and seek for different things in the collaboration (Dacin et al., 1997). Varieties in aspects like organisational and individual agendas, resources and expertise, purposes and motives for participation may lead to conflicts of interest. Further, there is a dilemma with regards to defining common goals: clarification will facilitate direction for the collaboration, but open discussions about conflicting agendas might cause awareness of differences (Huxham & Vangen, 2004). Therefore, Huxham and Vangen (2004) argue that instead of creating clearly defined goals, sometimes the only practical option is to state aims in a vague enough manner for no actor to disagree, and then get started with some action instead.

Second; another challenge for managers and participants of inter-organisational collaboration is the dynamic settings of such arrangements; collaborations are not static but continuously changing, affected by both internal and external shifts. External factors include changes with regards to e.g. government policies or market disturbances. Internal factors include changes in membership as new actors may join and others leave. Changes within individual member organisations such as mergers, acquisitions and restructures could result in consequences also for the collaboration. Moreover, as relationships between individuals are of high importance in collaboration processes, changes in participation on an individual level can also be sensitive for the collaboration (Ebers & Grandori, 1997; Huxham & Vangen, 2004). Consequently, negotiations for collaborative purpose and agenda as well as organisational and membership structure are iterative processes (Huxham & Vangen, 2000). The development processes within collaborations have the dynamic structures of a feedback loop; reassessment, learning and adaption processes may lead to adjustments or even termination of the collaboration, thus changing previously implemented collaboration forms (Ebers & Grandori, 1997). For example; when an initial goal is reached, a new agenda must be negotiated (Huxham & Vangen, 2004; Waddock, 1988). Also, knowledge creation or sharing from previous activities add to collaborations' dynamic character. As initiatives develop, learnings are also made about collaborative processes; both general and collaboration specific (Hibbert & Huxham, 2005; Waddock, 1989). In addition, as the relationships between the involved partners develop over time, so will also the collaboration. There is a risk that when learnings take place, the participants have contrary experiences, which can lead to conflicting expectations of the collaboration (Dahl, 2014; Hudson et al., 1999).

Third; there are also challenges which are in particular difficult in collaboration between actors which are also competitors. In such arrangements, there are increased risks for power imbalance, e.g. when smaller companies are dependent on dominating partners. Also, the issues of developing trust are often highlighted as key for any collaboration but can be additionally challenging in these types of initiatives when there is history among rivals and an increased risk for knowledge leakage or opportunism. Moreover, it can be difficult to balance between

the two logics of collaboration and competition. In addition, the relations between participants might also shift as the collaboration can contribute to changes in relative market power, which could intensify the competition between the actors involved and increase the level of continuous change further. Consequently, there are large risks for tensions and conflicts between participants in collaboration with competitors (Dorn et al., 2016; Osarenkhoe, 2010; Peng et al., 2012; Tidström, 2009).

There are practices and conditions often highlighted as important in order to overcome the challenges described above, and to increase the possibilities of positive outcomes from the collaboration. Developing trust has already been mentioned. Previous studies have also highlighted the importance of distributing power in collaborations. Other aspects stressed in previous research include: the selection of partners and the inclusion of stakeholders; creating an environment of honesty and reliability; communicating openly, having support from the participants' management; implementing appropriate governance structures; and having skilled convenors (Huxham & Vangen, 2005; Paasivaara & Lassenius, 2003; Sherer, 2003). When the actors participating in a collaboration also are competitors, previous studies have highlighted additional need for introducing routines and mechanisms to handle the participants' complex relationships and to facilitate collaborative actions. Thus, formal agreements or contracts are often attractive in such set-ups. For such arrangements, there is an additional risk of conflict that must be handled, and the balance between collaboration and competition should be taken into consideration (Dorn et al., 2016; Eriksson, 2010; Faems et al., 2010; Osarenkhoe, 2010; Tidström, 2009). Possible strategies for conflict avoidance include practices such as team building activities; developing shared goals; emphasis on communicating internally and externally; and being aware of and accept organisational differences (Eriksson, 2010; Tidström, 2009).

To conclude; previous research on the organising and manging of inter-organisational collaboration have shown that despite all the good intentions, in practice, establishing and sustaining inter-organisational collaboration can be difficult (e.g. Ebers & Grandori, 1997; Eriksson, 2010; Waddock, 1988). In this section, three themes of challenges were highlighted: developing shared goals; operating in dynamic settings; and challenges specific to collaboration partners also operating as competitors in the same sector. Thus, for a collaboration to achieve its full potential, its practices should facilitate for the collaboration to overcome such challenges. Considering the lack of in-dept studies of inter-organisational collaboration in the energy efficiency field, such knowledge about collaboration in practice can increase the understanding about what makes these arrangements thrive or struggle and enhance their possibilities to succeed.

3 Methodology & methods

A combination of research interests and access opportunity pointed my attention towards the inter-organisational collaboration *Sweship Energy*. In the first section of this chapter, the case or the *field* is presented in more detail. Continuing, the ethnographic research approach and fieldwork are described. Next, the analysis of field material and the literature review are presented. Finally, quality measures applied in the study are discussed.

3.1 The field: Sweship Energy

The site of this study is the emerging inter-organisational collaboration *Sweship Energy*. It is an initiative aiming for increased energy efficiency in the Swedish shipping industry. The collaboration emerged under the motto *shared knowledge*; administrated and managed by a business association for Swedish shipowners. Sweship Energy's partners, in contrast to most previously studied energy efficiency collaborations (e.g. Jochem & Gruber, 2007; Paramonova & Thollander, 2016), operated in a single industry but represented a heterogenous group of organisations with regards to characteristics such as company sizes and energy efficiency performances. Thus, some of the participating companies were also competitors[7]. Different aspects of Sweship Energy's development are illustrated in Figure 1: identified primary activities; public funding; management team participants; and the labelling of the collaboration. Each of these aspects are briefly described below.

Since the discussions about establishing a collaboration intensified in 2012, the collaboration's primary activities have included: 1) a project to build a database of energy efficiency measures; 2) a series of workshops to educate onboard personnel in matters related to energy efficiency; and 3) the establishment of a network of energy efficiency experts in the partner organisations, facilitating knowledge and experience sharing. During 2015, there were discussions between the management team, partners and others about the overall approach and focus of the collaboration.

The collaboration was mainly financed through public funding. Over the years, the collaboration has in total received three grants; one from the Swedish Maritime Administration and two from the Swedish Energy Agency. Two of the grants were received for executing the database project and developing a workshop concept. The third grant was for developing the collaboration into a so-called *innovation cluster*, enabling the establishment of the expert network.

The responsibilities collaboration's management team included managing collaborative activities, executing administrative tasks, applying for funding and developing long-term strategies. Over time, the group has shifted in size and constellation. Two of the participants, the CEO[8] and the project coordinator, were fully employed by the business association which managed the collaboration. The others were working for the collaboration on a consultancy basis. An exception was me; as a PhD student, I have been partly employed by the association,

[7] The shipping industry consists of several different segments; such as bulk shipping, liner shipping and specialised shipping. Also, different companies specialise on different types cargo etc. Thus, not all shipping companies are competitors.

[8] To be more precise; the CEO title came from him being CEO for the subsidiary of the industry association which managed the collaboration, and thus, him being the responsible for the collaboration.

and between June and November 2015, I had a role in the collaboration's management team, which is described more in detail later in this chapter.

The labelling of the collaboration shifted over time. First, the management team labelled the initiative a *secretariat*, then shortly a *competence centre*, before they called it a *network* and finally a *platform*.

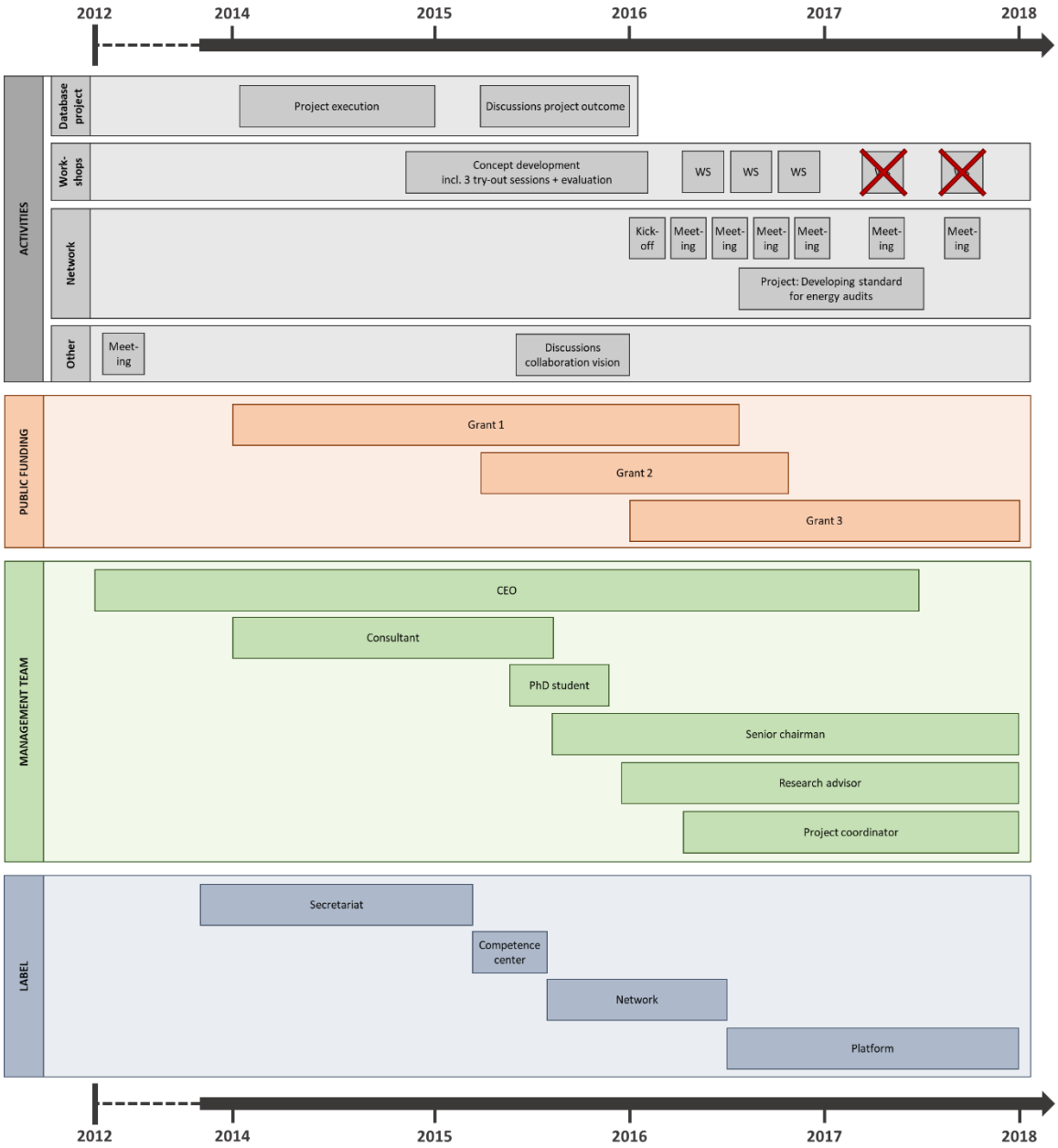

Figure 1. The development of Sweship Energy.

3.2 Ethnographic research approach & fieldwork

"The field is where other people live and work. […] Fieldwork is an expression of curiosity of the Other – of people who construct their worlds differently than we researchers construct ours." (Czarniawska, 2007:9)

For this study, I gained an official role within Sweship Energy; as a PhD student partly employed by the collaboration. I was recruited to aid in the development of Sweship Energy meanwhile carrying out research, studying phenomena that I identified as interesting along the way. With the broad interest of the organising and managing of the collaboration, I initiated the study trying to stay open minded, letting the findings on the field guide the research focus and approach.

The concept of practice "*includes both the explicit and the tacit. It includes what is said and what is left unsaid; what is represented and what is assumed. It includes the language, tools, documents, images, symbols, well-defined roles, specified criteria, codified procedures, regulations, and contracts that various practices make explicit for a variety of purposes. But it also includes all the implicit relations, tacit conventions, subtle cues, untold rules of thumb, recognizable institutions, specific perceptions, well-tuned sensitivities, embodied understandings, underlying assumptions, and shared world views.*" (Wenger, 1998:47). Consequently, studying practices can entail observations of sayings, doings, and their various patterns (Nicolini, 2009), also including collecting documents or following artefacts (Gherardi, 2012).

Fieldwork enabled me to study not only the actions taken by people in Sweship Energy's management team, participants in collaborative activities and others, but also their accounts of the actions. I could also observe some of the things that they saw, read or heard which were produced elsewhere. The field is important to organisation and management scholars because that is where the actions and the accounts of action exist and emerge. It is where the production of accounts can be studied; fieldwork enables researchers to explore how organising and the accounts of organising is produced. Moreover, since people in the field also consume accounts produced elsewhere, by doing fieldwork, researchers can study how and what people on the field select among these (Czarniawska, 2007). In this thesis, I interpret observations made on the field as local, contextual examples of more general phenomena. With regards to human activity, Flyvbjerg (2006) highlights the value of contextual knowledge over predictive theories. A benefit of focusing on single settings is that it facilitates in-depth studies (Hammersley & Atkinson, 2007), suitable for the practice-oriented perspective applied in this thesis. Another positive aspect is that the exploration of one field in detail enabled me to test views directly as the phenomena unfold in practice (Flyvbjerg, 2006).

During the first six months of PhD studies, my role evolved into what could be described as a project coordinator for Sweship Energy. During this time, I had a desk space in the collaboration's premises, and thus, full access to the collaboration; both the management team and collaborative activities. Since the management team was located in the premises of the business association managing it, I also had access to other activities within the business association as well as the Swedish shipping industry in general. At this time, two primary activities were on-going within the collaboration; the database project and the development of a workshop concept. One part of my work for the collaboration was intended to be gathering ship related information from shipping companies to integrate into the database – in parallel

with studying the database from an academic perspective. However, as the database project did not go according to plans (see paper II for more details), my focus shifted towards understanding the database project as a *project*; studying both on-going discussions as well as the project's previous development. I was also involved in the work with the workshops for onboard personnel. During the concept developing phase, I was responsible for adjusting and continue developing an emerging concept. At the final try-out session, I coordinated the planning and organising of issues like the program and booking presenters according to my developed vision. For in total five workshop occasions, I was responsible for documenting the presentations and discussions. Also, after two of the sessions, I conducted interviews with participants; both for the collaboration's behalf as well as research purpose. For the additional workshops, I could give input to the questions for the follow-up interviews and got access to the notes afterwards. In the end of the concept development phase, I executed an evaluation of the workshops; interviewing participants, and presenters as well as people from the collaboration management team, academia and others. In addition to being involved in these two activities, my work for the collaboration also included participating in long- and short-term planning, discussions with existing and potential funders as well as representing the collaboration at meetings with e.g. potential partners and others.

This type of arrangement; fieldwork done by a researcher becoming an employee, is according to Czarniawska (2014) the superior approach to fieldwork. However, despite all the promising outlooks, there are also challenges with such a set-up. If the work tasks are highly demanding, it can be difficult to achieve both two roles as employee and researcher (Czarniawska, 2014). Bruyn (1963) describes the difficulties for researchers to balance the two needs of being personal involved in the field and at the same time being detached to it. Other challenges include getting access to such positions and having specific skills needed at the field (Czarniawska, 2014). The arrangement for my study offered a golden opportunity with regards to access; to the collaboration's management team and partners, the business association and its member companies as well as shipping industry events. However, I found myself struggling with the balance of my two, sometimes conflicting roles of *working for* versus *studying* the collaboration. According to Charmaz (2014), it is common for researchers with research approaches similar to mine to become more involved in the field than anticipated, or finding the involvement to be of a different order than expected. In addition, access is not static but has to be continuously renegotiated (Czarniawska, 2014). Partly due to the struggles of balancing my roles, after around six months my role shifted; from more to less participatory. It helped me finding my role as a researcher, but I lost the access to the everyday practices of the management team. However, I could still participate and observe the collaboration's activities and have formal and informal interviews and conversations with both the members of the management team as well as other collaboration partners and participants. Also, I continued to document the workshops, and in addition, when the network for energy experts was established, I gained access by becoming responsible for documenting the meetings and writing the official notes.

The methodology used for my study belongs to the ethnographic research tradition, which is a common approach for practice-oriented studies (Gherardi, 2012). The definition of *ethnography* can vary, and the label is not used in a standard fashion (Hammersley & Atkinson, 2007). Also, there are overlaps between the ethnographic research approach and others, such as case study, fieldwork, window study and participant-observation. However, the

methodology in this licentiate is in line with all key features common to ethnographic work as described by Hammersley & Atkinson (2007): First, the research was interpretive, and the fieldwork focused on people's actions and accounts in a single setting; Sweship Energy. Also, the study was performed in an everyday context, not in an experiment setting set-up by me as a researcher nor through highly structured interviews. Moreover, as previously described, the field material was gathered from a range of sources, where participant observations and informal conversations constituted an important part. Continuing, the research was of exploratory nature and the research design was not fixed or detailed at start; I stepped into the field with no strict plan and with the open interest of studying the organising and managing of inter-organisational collaboration aiming for energy efficiency. Hence, I let the findings on the field guide the development of both research approach and focus. In the same fashion; instead of using e.g. structured observation schedules, the process of analysing the material generated the analysis themes and categories.

Ethnographic approaches have been proposed as highly suitable for explorations of inter-organisational fields as they allow for insights about social dynamics (Zilber, 2014), and for explorations of the details of everyday life and the extraordinary-in-the-ordinary (Ybema, 2009). Thus, it enables learnings about *"what 'actually happens' or about 'how things work"*" (Watson, 2011:204). Advantages of such an approach include: 1) direct access to people, events and scenes; 2) longitudinal participation; 3) real time observations of actions and events; and 4) opportunities to explore emergent patterns or problems (Charmaz, 2014).

Table 1. Overview of the fieldwork executed in the study and a breakdown of executed interviews.

Fieldwork activity	Amount
Fieldwork, in total [hours]	**~ 1000**
Field notes & interview transcripts [number of]	**~ 250**
Recorded interviews, in total [number of]	**30**
Shipping companies	*25*
Land organisation	15
Onboard personnel	10
Management team	*3*
Academia	*2*
Workshop sessions [number of]	**5**
Network meetings [number of]	**8**
Non-recorded interviews & conversations [number of]	**Numerous**
Other meetings & industry events [number of]	**Numerous**
Documents collected	**Numerous**

When collecting field material, I tried to stay pragmatic; wherever interesting and relevant the field went, I followed. Between June 2015 and February 2018, I spent around 1000 hours doing fieldwork, see Table 1 for an overview. The collected material was documented in about 250 different field notes and interview transcripts, ranging from ½ to 25 pages each. A range of sources was drawn on, including: studying actions and accounts of the management team; observing and participating in collaborative activities; executing semi-structured interviews with the management team, partners and others; having informal conversations with a range of people; and participating in industry events. In addition, different documents were collected, such as meeting notes, organisational charts, guidelines, PowerPoint presentations, workshop assignments, e-mails, webpage updates, newsletters and tweets. In addition to the numerous informal interviews and conversations, I executed 30 recorded and transcribed semi-structured

interviews; see Table 1 for a breakdown of these. Interviews offer a space for creation of stories (Czarniawska, 2014) and they deepened my knowledge by enabling me to further explore observations preceding the interviews. It also allowed me to collect stories and accounts about broader topics relevant for my research aim, such as network participants' view on the progress of the collaboration, or onboard personnel's experiences about their organisations' energy efficiency efforts in general.

Modern organisations are often geographically spread and the organising is on-going at several places in parallel – a common challenge for researchers on the field. Czarniawska (2007) describes it as follows:

> *"Modern organizing […] takes place in a net of fragmented, multiple contexts, through multitudes of kaleidoscopic movements. Organizing happens in many places at once, and organizers move around quickly and frequently."* (Czarniawska, 2007:16)

This is often true for inter-organisational collaborations as well (Zilber, 2014), and my field of study was no exception. For this reason, the telephone was a big aid in my field material collection; it enabled me to faster 'move' between different places. Over time, I developed a method including recurring phone calls to identified key actors. The conversations were informal and trust building, while I received accounts about the latest actions and happenings within and around the collaboration. With time, these people also started to contact me when they had information that they thought was of interest for me. This became a valuable complement to other field material from e.g. observations and more structured, recorded interviews.[9]

3.3 Analysis of field material & literature review

From this rich material, different themes were highlighted and extracted for each paper appended in this thesis, through an interpretive method performed in several steps (Charmaz, 2014). In an initial phase, the focus was identifying broad themes that was found intriguing for continued examination. For paper 1, the collaboration's shifts over time with regards to focus (from industry mass to industry energy efficiency champions) and organisational structure (from a top-down approach to offering a platform for knowledge exchange) were highlighted as an interesting theme. For paper II, variations in expressed perceptions about the database project among different actors was identified as an interesting topic in the material. The continuing collection of material was then adjusted to these identified themes in line with an *abductive* approach (Czarniawska, 2014).

The second step of the analysis involved coding the material, using the computer software *NVivo*. For paper I, the coding focused on the by practitioners experienced challenges. Also, the practices within the collaboration's activities were identified. For paper II, the first level of coding focused on specific actors and material related to each of their stated perceptions. Next, the coded material for paper II was characterised according to three identified topics: 1) how

[9] As described, this approach evolved over time, from a need to solve a challenge I was facing on the field. However, there are documented methods similar to mine; including *diary: diary-interview* (Zimmerman & Wieder, 1977), *observant participation* (Czarniawska, 2007) and *ethnographic interview* (Spradley, 1979). As these methods normally are agreed upon on beforehand, they seem more formalised compared to mine. An additional difference is that in the diary: diary-interview method, the regular interviews were combined with diary writing between the interviews (Zimmerman & Wieder, 1977), something my interviewees did not perform.

different goals, visions and purposes guided the creation of the database; 2) how internal and external changes affected the creation of the database; and 3) how the outcome of the project was perceived.

I explored literature and previous research throughout the whole project; not only about topics included in the thesis but from a range of fields and research traditions. However, it was not until late in the process that I executed a literature review in depth. It is common for studies initiated with open ended research designs to not start the project with an extensive literature review, but rather to wait with it until later. Since the research focus is guided by the findings on the field, reading for theoretical connections is normally made during the study, not on beforehand (Czarniawska, 2014).

3.4 Quality measures

"*The problem of reactivity is merely one aspect of a more general issue: the effects of audience, and indeed of context generally, on what people say and do. All accounts must be interpreted in terms of the context in which they were produced. The aim is not to gather 'pure' data that are free from potential bias. There is no such thing. Rather, the goal must be to discover the best manner of interpreting whatever data we have, and to collect further data that enable us to develop and check our inferences.*" (Hammersley & Atkinson, 2007:102)

Maxwell (2013) stresses that it is not possible to eliminate aspects such as the researcher's beliefs, values and expectations in order to deal with the issue of bias. Instead, similar to Hammersley and Atkinson's statement above, Maxwell argues for researchers to reflect upon *how* these aspects affect may influence their studies, and for trying to avoid the negative consequences of these. With regards to the issue of bias, the variety of methods used for field material collection for this thesis was a strength. By comparing field material compiled from different types of sources[10], such as participant observations, interviews or collections of documents, the validity of the study was increased. In addition, in the analysis of the study, comparisons were performed on accounts from different people at different times around the same phenomenon[11], which strengthened the findings further (Hammersley & Atkinson, 2007).

The value of validating the findings with studied practitioners[12] has been discussed among scholars. Possible benefits with such a strategy lies in the fact that there might be information or knowledge that the researcher is not aware of, only the practitioners. However, there is a risk that this information might be false. Also, partly due to limited capacity in self-reflection, it has been stressed that the value of respondent validation is lower when the analysis is not in line with the practitioners' self-images (Abrams, 1984; Hammersley & Atkinson, 2007; Silverman, 2014). For this thesis, I went the middle way. At the first half of the licentiate project, every six months I had seminars with the practitioners, presenting and discussing tentative findings and early analyses. These discussions often provided additional information or accounts which I handled as any other collected material as it was included in the analysis processes. In addition, with some of the practitioners involved, I also had conversations later in the project about analyses which were more mature; these were performed in an informal fashion and did not aim for consensus or approval.

[10] This strategy is usually called *method triangulation*
[11] This approach is often called *data-triangulation*
[12] So-called *respondent validation*

4 Summary of appended papers

Below are summaries of the two appended papers.

4.1 Paper I: "Collaboration for Sustainable Development: Interrelating Practice and Challenges"

Paper I explores the interrelation between practices and challenges within Sweship Energy, and analyses this interrelation's influence on the collaboration's development, guided by the question *how do practices and experienced challenges influence the development of emerging collaboration?* The study examines why certain practices developed and became prioritised in the strive for achieving increased energy efficiency. In order to analyse these practices, the study focuses on three primary activities identified within Sweship Energy, and their development as the collaboration emerged: 1) a project to build a database of energy efficiency measures; 2) a series of workshops to educate onboard personnel in matters related to energy efficiency; and 3) the establishment of a network of energy efficiency experts in the partner organisations, facilitating knowledge and experience sharing. Furthermore, the paper delves into some of the challenges experienced by the practitioners taking part in the collaboration: creating engagement; developing a shared vision; and securing funding.

Based on the findings, this paper argues that: 1) there is an interrelation between practice and experienced challenges, and 2) this process of interrelating has influenced the development of Sweship Energy's activities. From the analysis, two shifts are identified. The first shift considers the collaboration's vision; from focusing on spreading and mainstreaming existing knowledge to the industry mass, to aiming to improve state of the art by supporting a limited number of industry champions. The second shift consider the Sweship Energy's organisational structure; from a top-down approach with outreach activities, to a more passive intermediary role offering a platform for knowledge exchange.

4.2 Paper II: "Inter-Organizational Knowledge-Sharing for Energy Efficiency in Practice: The Case of a Database Project"

Paper II delves deeper into the first of Sweship Energy's primary activities; the database project. The study aims to explore the complexities of establishing knowledge sharing practices between organisations through the creating of a database. It contributes to the understanding of the challenging tasks of establishing such practices aiming for increased energy efficiency.

The paper explores the development of the project, focusing on the actors' diverging perceptions of the project. It is guided by three research questions: 1) How did different articulated goals, visions and purposes guide the creation of the database? 2) How did internal and external changes affect the creation of the database? 3) How was the outcome of the database project perceived?

The paper illustrates potential challenges of an emerging inter-organisational collaboration and the complexities of organising between organisations. One of the challenges discussed is the difficulties of agreeing upon a shared vision, and to concretise the project and its goals clearly enough, making sure all actors *actually* agree upon the same idea. The study also highlights the challenges of operating in a collaborative setting that is continuously changing with regards to aspects like organisational structure, strategy and aim. The paper argues that it is important to highlight the need to maintain realistic expectations for such initiatives and the necessity to allow these arrangements to develop over time.

5 Discussion

In this chapter, findings related to each of the three research questions will be discussed:

RQ1: How can experienced challenges in the collaboration be understood?

RQ2: How are practices in the collaboration developing over time?

RQ3: How can the emergent organising of the collaboration be characterised?

5.1 How can experienced challenges in the collaboration be understood?

In the two papers, several experienced challenges are highlighted and illustrated. This section will focus on discussing three overarching difficulties: to develop and agree upon a shared vision; to operate in a continuous changing setting; and thus, to achieve a long-term perspective.

Both papers included in this thesis confirm previous research on inter-organisational collaboration (e.g. Hudson et al., 1999) by illustrating Sweship Energy's challenges of developing a shared vision that all actors involved not only agreed upon, but also perceived in a similar manner. These difficulties went beyond creating shared goals; the challenges also included agreeing on aspects such as the collaboration's organisational structure and target groups as well as practices and collaborative activities. Such struggles are common in inter-organisational collaborations (Vangen & Huxham, 2011) and with a diverse group of participants, the complexity of such a task might increase. On one hand, Sweship Energy's partners operated in a single industry and were in that sense more homogenous than most previously studied energy efficiency collaborations. However, on the other hand, they were also a heterogenous group of organisations with regards to company sizes and energy efficiency performances. This type of set-up implies both possibilities and difficulties. Such an arrangement indicates that the participants should have much to learn from each other (Paramonova & Thollander, 2016). However, a collaboration's shared goals exist in parallel with organisational and individual goals for participation (Huxham & Vangen, 2004). Thus, as illustrated in the shifts presented in paper I, it seems as it was difficult to balance the requests and demands from both large and small companies as well as the energy efficiency champions and others. As a consequence, the focus of the collaboration was constantly renegotiated. It seems as this type of set-up might have added to the challenges of developing and agreeing upon a shared vision. This illustrates a common contradiction within inter-organisational collaboration; even if the participants' differences was a motivation for initiating the collaboration in the first place, the same differences can also make the participants strive for different things, and thus, even challenge the collaboration's existence and survival (Dacin et al., 1997).

The appended papers also point towards another challenge for Sweship Energy; continuous change. Shifts in participants' involvement – as some actors joined and others left – as well as the difficulties of securing funding are examples of aspects contributing to continuous change for Sweship Energy. This is a typical issue for such an arrangement as inter-organisational collaborative settings are dynamic with both internal and external changes affecting the collaboration (Ebers & Grandori, 1997; Huxham & Vangen, 2004). Consequently, Sweship Energy's vision and development were constantly renegotiated, adding to the difficulties of developing a shared vision which all actors could support and agree upon. This supports previous research which states that negotiations about collaboration purpose and agenda are

iterative processes (Huxham & Vangen, 2000). Considering the setting's dynamic character, it seems as it was difficult for the collaboration's management team and partners to anticipate future conditions and development. Thus, it can be argued that Sweship Energy's changing setting did not promote a long-term perspective.

To summarise how experienced challenges in Sweship Energy can be understood, two aspects can be highlighted:

1. Sweship Energy's organisational structure might have added to the difficulties of agreeing upon a shared vision[13]. Since a collaboration's shared goals exist in parallel with organisational and individual goals for participation, it can be challenging to balance the requests and demands from a diverse group of partners.

2. The practitioners in Sweship Energy struggled with anticipating future conditions for the collaboration, which did not promote a long-term perspective. Inter-organisational collaborative settings are continuously changing which contributed to Sweship Energy's vision and development being constantly renegotiated.

5.2 How are practices in the collaboration developing over time?

Considering the difficulties within Sweship Energy to develop a shared vision, it can be argued that the goal that was initially developed – *knowledge sharing for increased energy efficiency* – was not clear but vague enough for no-one to disagree to. Beyond this vague goal, it seems as in the initial phase, not much effort was put into developing a shared vision for the emerging collaboration with regards to e.g. measurable goals, target groups, collaborative approach or organisational structure. Instead, the management team in Sweship Energy focused on getting started with some action – such as applying for funding and developing a database. Approaches similar to this have been shown to exist in other cases of inter-organisational collaborations as well. Huxham and Vangen (2004) contrast literature claiming the importance of creating clear goals by highlighting the pragmatic features of this type of strategy. Since the processes of setting goals can highlight differences in perceptions (ibid), it is possible that a larger emphasis on such a task within Sweship Energy could have been counteractive in terms of motivating participation. However, as illustrated in paper II, it seems as the lack of a shared vision also had negative implications for Sweship Energy, since it appears to have been a continuous source for discussions that contributed to some of the collaboration's conflicts. This would be in line with previous research which highlights developing a shared vision as an possible strategy for conflict avoidance in inter-organisational collaboration (Eriksson, 2010).

In contrast to the standardised Swiss and German networks (Koewener et al., 2011), but confirming previous studies of energy efficiency collaborations in Swedish settings (Paramonova & Thollander, 2016), Sweship Energy was not initiated as a network with e.g. regular meetings. Instead, the practices in Sweship Energy developed over time with regards to both focus and process as well as actors involved, see Figure 2. Paper I described how the collaboration's practices evolved: from focusing on establishing the vision of a collaboration and developing a basis for the continuing initiative; via educating and knowledge sharing for onboard personnel; to practices of relational (e.g. trust building) and business characters (e.g. bench-marking) while continuing with knowledge sharing practices. Throughout all activities,

[13] Regarding aspects like the collaboration's organisational structure, goals and aims, target groups, and collaborative activities.

in parallel to these shifts, encouraging energy efficiency was identified as a key practice. In addition to changes of *which* practices, there was also a shift with regards to collaborative processes and *how* the organising and the collaborating were performed. Initially, the strategy within Sweship Energy was to increase the shipping industry's energy efficiency performance with a top-down approach with outreach activities. With time, Sweship Energy's approach shifted towards a more passive intermediary role, offering a platform for knowledge exchange. Moreover, which actors that were targeted by the collaborative activities also shifted; from addressing the industry mass, to supporting a more limited number of energy efficiency champions.

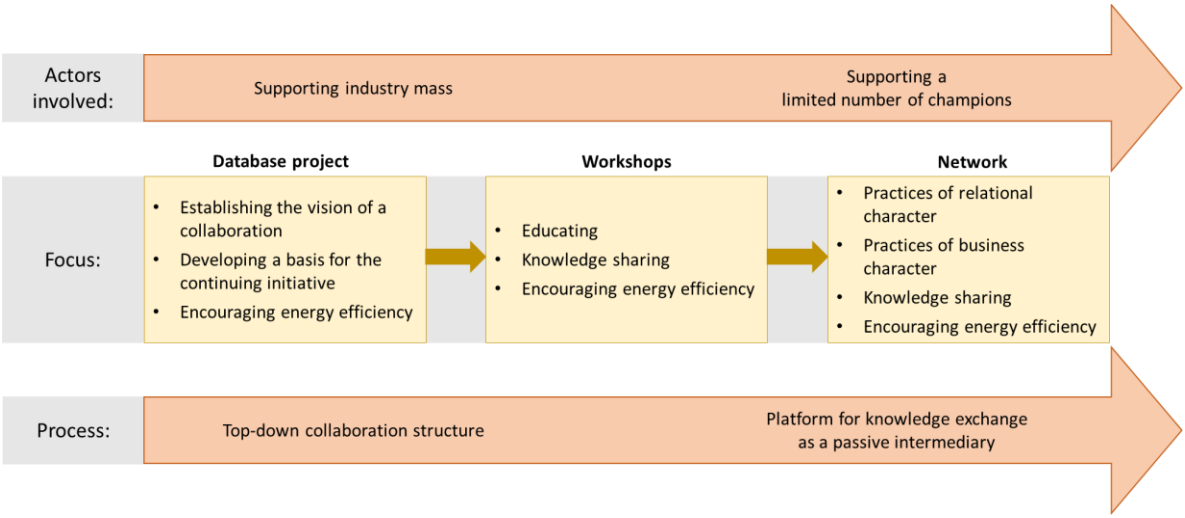

Figure 2. The development of practices in Sweship Energy. (Further developed from Figure 2 in paper I)

These shifts in practices point towards the puzzling task of establishing and maintaining a collaboration. The findings in paper I indicate that the development of Sweship Energy's practices was interrelated with experienced challenges in the collaboration. It would seem as if there was a two-way influence between the evolution of practices and experienced challenges. As a consequence, the experienced challenges affected the collaborative practices, and the practices were adjusted based on difficulties faced within the collaboration. For example, in theory, knowledge sharing between champions and industry mass is considered an important practice in order to achieve a more energy efficient and sustainable society. However, in practice, motivating the champions for such an arrangement can be difficult, which could put the collaboration at risk. Consequently, the practices were over time adjusted in order to create engagement among the champions and to motivate them to participate. Thus, this thesis argues that the shifts in practices were results of strategies to keep the collaboration alive.

When comparing the practices in the standardised Swiss and German networks with the ones in Sweship Energy's *network for energy experts*, both similarities and differences were identified. Both types of networks included knowledge sharing between participants through regular meetings. Another similarity was the knowledge creation by occasional visits of external experts educating the network participants. However, in the standardised networks, it seems as if there is much focus on *measurable* targets associated with energy efficiency performance; on creating such goals (both shared and actor-specific) and on monitoring potential progress related to these developed goals. The pronounced vision with Sweship Energy's network was also to increase the energy efficiency performance among its

participants. However, as described in previous sections, Sweship Energy's goals were general, and no measurable goals were developed within the collaboration; neither of organisational character nor regarding energy and emission reductions. Moreover, the emphasis within the Swiss and German networks on monitoring the participants' progress in energy efficiency performance could not be identified in Sweship Energy. In that sense, these findings support previous research stressing a lack of emphasis on developing measurable goals and reporting progress in Swedish energy efficiency collaborations (Paramonova & Thollander, 2016). However, within Sweship Energy, another approach for evaluating the collaboration was adopted; the involvement of me as a PhD student. From that position, I followed and analysed the development of the collaboration and its activities from an organisational and managerial perspective. However, as the emphasis on creating measurable goals was limited within Sweship Energy, I did not relate my analyses to any such collaboration goals.

Thus, there are different ways to measure value in inter-organisational collaboration, where monitoring progress against measurable reduction targets is just one strategy of several. However, depending on situations or conditions, different approaches might be varyingly beneficial. As applications for public funding in this area often demands estimations on expected reductions in energy consumption or emissions, it is possible that securing funding – an identified experienced challenge within Sweship Energy – could have been eased by a strategy that could present figures on e.g. potential energy reductions in kilowatt, fuel savings in tons, or emission reductions in percentage. Considering how the funding systems are constructed, for a collaboration with limited emphasis on monitoring progress against measurable targets, it would seem as it is additionally challenging to argue for the societal value of the initiative, and consequently be more difficult to be granted funding. Thus, as policy makers tend to point towards inter-organisational collaborations as a means towards sustainability and increased energy efficiency, it could be of importance for funding agencies to evaluate how arrangements with set-ups like the one in Sweship Energy can better fit into public funding systems. In parallel, for Sweship Energy, it could also be of value that its management team reflect upon if and how the collaboration could adopt its goal setting and evaluation practices to the funding systems without losing its basic characteristics. Another situation where it can be of importance to present the value of the collaboration is when discussing with existing or potential partners about participation, especially as previous studies have highlighted top management support among partner organisations as important for the success of energy efficiency collaboration (Jochem & Gruber, 2007; Paramonova et al., 2015). Considering Sweship Energy's lack of emphasis on monitoring progress against measurable goals as well as the collaboration's experienced challenge of creating engagement, it would be interesting to explore the collaboration further with the aim to better understand the practices of motivating participants; both between the management team and the participants, and within the partner organisations to secure top management support (see chapter 6 for more about suggested further research).

Summarising the development of practices within Sweship Energy, three things can be argued:

1. The actors involved in Sweship Energy agreed upon a vague enough goal for no-one to disagree to – and then got started with action. As a consequence, the vision of the collaboration was a continuous source for discussions.

2. The practices in Sweship Energy shifted over time; with regards to both focus and process as well as actors involved. These shifts can be explained by a two-way interrelation between the development of practices and the experienced challenges in Sweship Energy. Thus, the collaborative practices were adjusted based on difficulties faced within the collaboration in order to keep the collaboration alive.

3. The practices in Sweship Energy's *network for energy experts* differ from the ones in Swiss and German networks, as there is no emphasis on developing measurable reduction targets and monitoring progress related to such within Sweship Energy. Consequently, it might be difficult for the practitioners to argue the value of the collaboration. Thus, it might be additionally challenging to secure funding, and for the participants to gain top management support.

5.3 How can the emergent organising of the collaboration be characterised?

When analysing the papers again from a holistic perspective, it can be argued that *improvising* (Cunha et al., 1999) characterise much of the emergent organising of Sweship Energy. As illustrated in the papers, it appears as if the collaboration's practices and development relied heavily on what funding, information and participants being available and active at each given moment.

Organisational improvisation involves addressing the unforeseen in continuously reconstructed processes without having the benefits of preparation (Hadida et al., 2015; Weick, 1993). It is an organising approach relying much on available resources and material (Cunha et al., 1999). Many scholars argue that improvisation can happen in varying degrees and forms (Cunha et al., 1999). However, in organisations relying heavily on improvising; instead of starting with planning and act afterward, actors start with action and make in retrospective sense of their experiences (Crossan et al., 2005). Defining organisational improvisation has been a long-lasting discussion among researchers, but for this thesis, I follow Cunha et al. (1999) in that:

> *"[organisational improvisation is the] conception of action as it unfolds, by an organization and/or its members, drawing on available material, cognitive, affective and social resources"*
> (Cunha et al., 1999, p.302)

Previous research has identified several triggers for organisations to adopt an improvisation approach. In contrast to many previously studied cases of organisational improvisation, it appears as lack of time (Crossan et al., 2005) was not a characteristic of Sweship Energy. As illustrated in the papers and this thesis, when portraying the collaboration's development and practices, the pace of action could rather be described as slow. Instead, the previously described constant changes in Sweship Energy's setting and difficulties of achieving a long-term perspective are factors that might have contributed to stimulating improvisation processes. This is in line with previous research, stating that high levels of unforeseen events increase the prospects of improvisation (Crossan et al., 2005). Moreover, since Sweship Energy was an emerging collaboration, there were a lot of *first times* for the practitioners regarding issues like securing funding or dealing with conflicts of interest. Thus, Sweship Energy might have had a low level of organisational memory and limited existing routines – conditions also increasing the probability for improvisation (Miner et al., 2001). In addition, as illustrated in the appended papers as well as this thesis' prologue; the culture within Sweship Energy could be described as experimental, promoting action and experimentation rather than reflection and planning,

which previous research have shown also foster improvisation (Cunha et al., 1999; Miner et al., 2001).

A possible consequence of adopting an improvising approach is increased flexibility. Such an organising enables organisations to quickly adopt to changes (Cunha et al., 1999). Thus, it seems as by applying an approach that could be characterised as improvising, Sweship Energy was enabled to adopt to its continuously changing setting and to act despite its lack of long-term perspective. However, as organisations improvise in order to handle unplanned events, there is also a possibility for unintended consequences from those improvised actions, resulting in a complex spiral of unexpected happenings. Also, there is a risk for over-reliance on improvisation, neglecting the needs for some structures and plans (Cunha et al., 1999; Mintzberg & Waters, 1982). Even if organisations that adopt improvising approaches draw on available resources and material, some scholars state that there is no absolute contradiction between planning and improvising. Instead, they argue that improvising can be described as a (short-term) deviation from a plan, which take place when actors involved see a value for such a deviation in relation to the plan's goals (Gustafsson & Lindahl, 2017). In contrast to other previously studied energy efficiency collaborations, it seems as if there was not much emphasis on developing plans within Sweship Energy; neither for the initiative as a whole, nor for its different collaborative activities. Instead, the collaboration's CEO repeatedly stressed *growing organically* as a development strategy. Thus, it appears as the improvising in Sweship Energy was not a result of deviations from its plans, but rather a consequence of its dynamic setting and the difficulties of creating a shared vision in combination with a lack of emphasis on planning. Considering the identified experienced challenge of creating engagement, it is possible that Sweship Energy's lack of plans and clear goals, in combination with its improvising approach, did not allow the collaboration to achieve its full potential. Instead, it seems as there was an over-reliance on improvising within Sweship Energy. Consequently, this thesis argues that in order for Sweship Energy to further benefit from the positive aspects of improvising, the actors involved should strive for a better balance between improvising and planning, and extend their emphasis on the latter. There is a possibility that such a strategy would increase the collaboration's prospects of positive outcomes and thus, its chances of survival.

To summarise how the emergent organising of Sweship Energy could be characterised, two points can be stressed:

1. As the collaboration's practices and development relied heavily on what funding, information and participants being available at each given moment, improvising can be argued to characterise much of the emergent organising of Sweship Energy. Factors that could have contributed to Sweship Energy's improvisational approach include operating in a setting of continuous change and difficulties of achieving a long-term perspective as well as a low level of organisational memory and limited existing routines.

2. A consequence of relying on improvising as the organising is increased flexibility and thus, by applying such an approach, Sweship Energy could adopt to its continuously changing setting and act despite its lack of long-term perspective. However, it seems as there was an over-reliance on improvisation which in combination with a lack of plans and goals might have not allowed Sweship Energy to achieve its full potential.

6 Conclusions and suggested further research

The aim of this licentiate thesis was to better understand the emergent organising of an inter-organisational collaboration for energy efficiency in shipping, from a practice-oriented perspective. Identified gaps in the energy efficiency literature regarding the issue of inter-organisational collaboration indicate that in order to better understand what makes such arrangements thrive or regress into a state of collaborative inertia, we need more knowledge about how such collaborations are accomplished in practice.

This thesis contributes with a more nuanced understanding of the complexities in establishing and maintaining energy efficiency collaboration, and for achieving positive outcomes from such endeavours. With a practice-oriented perspective, the study complements previous research in the field. By executing an ethnographic, longitudinal study of a single collaboration, practices and experienced challenges could be explored in depth and the collaboration's development could be investigated over time. Moreover, with the chosen empirical setting, the study broadens the scope of energy efficiency collaboration in existing literature regarding aspects such as collaborative approach, organisational structure, and national context.

In addition to its theoretical contributions, the thesis also has practical implications. Considering that it is common for collaborations as Sweship Energy to receive public funding, it is important for policy makers and funding agencies supporting such arrangements to have good knowledge about what makes them succeed or struggle, and adjust the funding systems accordingly. In addition, the thesis highlights regional differences among energy efficiency collaborations, which is essential knowledge for this group of actors. Also, considering the daunting challenge that the shipping industry is facing regarding the need for reducing its emissions of greenhouse gases, the sector makes an interesting setting for studying inter-organisational collaboration as a possible policy measure for sustainability.

The study illustrates the complexity of managing and participating in collaboration between organisations. Thus, the thesis also contributes with relevant insights to the practitioners participating in such arrangements. By extending the knowledge about experienced challenges and practices, the study can improve the awareness and reflections about practitioners' actions in the collaborative setting. Thus, hopefully, the study also contributes to a greater chance for success and survival for such initiatives by decreasing the risk of collaborative inertia.

The thesis shows the relevance of taking the concept of organisational improvisation into consideration when studying inter-organisational collaboration. However, previous research on improvisation in settings of organising across organisational boundaries is scarce (Lindahl, 2003). Thus, the understanding of conditions and consequences for such approaches in collaborations is limited. The thesis contributes with some initial insights, indicating the relevance of executing further studies on the topic as much is yet to be explored.

As indicated in the discussion chapter, the thesis opens for interesting questions regarding practices of creating engagement, motivating participation and securing top-management support in energy efficiency collaboration with limited emphasis on monitoring progress against measurable goals. Further studies on this topic would allow for a better understanding of how actors within such collaborations are arguing for its value with no or few measurable goals to monitor its progress with. Moreover, it would be interesting to investigate this topic with emphasis on potential differences in such practices towards and among partners with

varying organisational characteristics; e.g. what are the similarities or differences between the practices of motivating champions to participate, compared to other organisations?

A final suggestion for further research is inspired by observations on the field; to explore how the concept of energy efficiency is translated in collaborations such as Sweship Energy. When the participants state that they discuss and share knowledge about energy efficiency, *what* is actually discussed? How is the concept of energy efficiency translated among members of management teams and collaboration participants – and are there any variations between different collaborative activities and different communities of practice, or over time as the collaboration develop?

Epilogue

It is interesting times for Sweship Energy. In the beginning of 2018, the collaboration's final public funding ended, and so far, they have not been granted any additional public support. Thus, even if the collaboration partly relies on the business association which manages and administrates it, its financial future is unclear and thereby the entire collaboration is at risk. In addition, during the last year, there have been changes in the composition of the management team. The CEO's responsibilities at the association changed, and he is no longer CEO for the collaboration. Instead, the project coordinator received a larger responsibility for Sweship Energy, but only part-time. Also, the senior chairman decided that it was time for him to step down and become a full-time retiree. Meanwhile, my support to the collaboration as a PhD student is about to end. Left, at least for now, is the project coordinator and the research advisor who still works for the collaboration on a consultancy basis. And, of course; all the partners that participate in the collaborative activities, mainly the network for energy experts. Thus, the times they are changing for Sweship Energy, maybe even more than before. It will be interesting to see whether the collaboration manage to continue to improvise its way forward, to develop and adjust, and survive even these challenges, or if it is heading towards the end of its journey.

Appendix I: Background – Energy efficiency in shipping

The context of the studied collaboration presented in this thesis is increased energy efficiency in the Swedish shipping sector. Understanding collaboration in this particular context is important since over 80 % of today's global trade by volume is transported onboard ships (UNCTAD, 2017), and the sector is facing a daunting challenge in reducing its emissions of greenhouse gases (GHG).

The global shipping sector accounts for about 3 % of GHG emissions (Smith et al., 2014), and by 2050, the sector's GHG emissions are predicted to increase with between 50 % and 250 %, depending on future economic growth and energy development (European Commission, 2018). Over the last four decades, the global shipping sector has had an average annual growth of 3 % (UNCTAD, 2017), and the industry's development, and thus emissions, are closely linked with the growth of the world economy and increasing global trade (Stopford, 2009). In addition, considering shipping being more efficient regarding GHG emissions per transport work compared to aviation or land transport; moving transportation from other modes to shipping is included in strategies such as the European Commission's White paper on transport (2011) for accomplishing goals targeting sustainable development and climate change.

In shipping, as well as several other industries, there is an identified gap between practice and theory regarding energy efficiency levels (Johnson & Andersson, 2014). The potential for a reduction in the shipping sector is considered high; a recent review by Bouman et al. (2017) stress the technical potential for CO_2 reduction by 2050 to between 33 % and 77 % for global shipping. Types of possible energy efficiency measures include optimisation of power and propulsion systems, hull design, and ship operations (Bouman et al., 2017). However, cost-effective energy reducing measures often fail to be implemented. Previous studies have highlighted a range of challenges contributing to this situation: lack of internal resources and outsourcing of technical competences (Johnson et al., 2014; Poulsen & Sornn-Friese, 2015); common business models that do not support effective energy management, such as contractual relationships where the fuel costs are not carried by the same organisations that own or operate the ships (Poulsen & Johnson, 2016; Rehmatulla & Smith, 2015); as well as difficulties for onboard personnel to reconcile the need for more energy efficient operations with the pressure of arriving on time and the demands for safety (Viktorelius, 2017). Previous research indicates that these challenges most likely would inhibit the shipping sector to respond to increased energy costs. Consequently, implementing policies such as CO_2 tax or trading schemes would not necessarily result in a sufficient reduction in GHG emissions (Pettit et al., 2016; Rehmatulla & Smith, 2015).

An additional challenge for regulating the shipping sector is the industry's global character. A ship can be owned, flagged, classed, insured, crewed, contracted and operated by several different organisations, each potentially based in different countries or even continents (Stopford, 2009). This creates difficulties allocating emissions to any particular national economy (IMO, 2018a). Consequently, the sector is not covered by existing or previous global agreements and protocols for abating climate change; neither the Paris Agreement (UNFCCC, 2015), the Kyoto Protocol (UNFCCC, 1998) nor the Doha Amendment (UNFCCC, 2012). On global policy level, the responsibility of decreasing the emissions from maritime transportations is instead designated to the International Maritime Organization (IMO); a specialised agency under United Nations (IMO, 2018a). Previous IMO agreements related to

energy efficiency have mainly focused on improving the ship design and the operation of ships[14], rather than on policies targeting organisational or national levels. However, in May 2018, the countries in IMO agreed on an initial strategy to reduce the total GHG emissions by at least 50 % by 2050. Moreover, the parties also agreed on goals for carbon intensity: a minimum of 40 % reduction in average CO_2 emissions per transport work by 2030 compared to 2008 levels, and to pursue efforts towards a 70 % reduction by 2050 (IMO, 2018b).

The shipping sector's need for increased energy efficiency, in combination with the challenges of implementing regulations, create an interesting setting for studying collaboration between organisations as a possible policy measure.

[14] E.g. the Energy Efficiency Design Index (EEDI) and the Ship Energy Efficiency Management Plan (SEEMP)

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